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### Factors That Determine The Outcome of Valvular Disease Among Patients, Based On The Type Of Hospital, Location Of Patient, And Type Of Insurance.

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# Factors that determine the outcome of valvular disease among hospitalized patients, based on the hospital type, location of patient, and type of insurance.

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## Background

## Results

## Discussion

- **Problem:**
- Valvular disease affects the valves of the heart and can lead to a range of complications if left untreated.
- In 2017, about 2.7% of the United States population had valvular disease. The CDC (Center for Disease Control) has estimated that about 25,000 Americans die yearly due to valvular disease .
- Mitral and aortic valve disease are the most common types of valvular diseases and could be either symptomatic or asymptomatic.
- **Known factors:**
- Age of the patient (particularly over 75 years) may determine the outcome of valvular disease in patients; however, the hospital type, insurance status, and location of the patients may determine the quality of care for patients and valvular disease outcome.
- Teaching hospitals are mostly in urban regions and house various specialists, tools and equipment that may be a major contributory factor to the outcome of Valvular heart disease among patients.
- Although patients with insurance have better healthcare access than patients with no insurance, the type of insurance may determine the quality of care and disease outcome. Patients may face delayed or restricted care and access to newer more expensive treatments based on insurance type.
- **Study Aim:**
- Assess the importance of quality of healthcare access in the outcome of valvular disease

**Table 1: Descriptive analysis Results**

Variable	Comorbidity absent N=		Comorbidity Present N=	
	N(column %)		N(column %)	
<b>Type of hospital</b>				
Non-teaching	3334 (77.51%)		60 (77.92%)	
Teaching	967 (22.49%)		17(22.08)	
<b>Insurance</b>				
No Insurance	657582 (13.53%)		7526(4.07%)	
Private Insurance	1511647 (31.11%)		12405(6.71%)	
Public Insurance	2690376 (55.36%)		165018(89.22%)	
<b>Gender</b>				
Female	4082463 (55.95%)		126270 (58.27%)	
Male	2996832 (42.33%)		90435(41.73%)	
<b>Patient Location</b>				
Rural	1278046 (18.13%)		38750 (17.92%)	
Urban	5772981 (81.87%)		1775019 (82.08%)	
<b>Household Income</b>				
Below 50 <sup>th</sup> Percentile	3857942 (55.74%)		107174(50.33%)	
Above 50 <sup>th</sup> Percentile	3063569 (44.26%)		105769 (49.76%)	
<b>Age at admission</b>				
Under 18 yrs	1152030 (16.27%)		2434 (1.12%)	
18-29	809318 (11.43%)		3335 (1.54%)	
30-49	1324980 (18.71%)		14315 (6.61%)	
50-64	1415369 (19.99%)		34246 (15.80%)	
65+	2378554 (33.59%)		162387 (74.93%)	
<b>Race</b>				
White	4387065 (65.76%)		164780 (79.66%)	
Black	993787 (14.90%)		20910 (10.11%)	
Hispanic	803765 (12.05%)		11571 (5.59%)	
Asian or Pacific	49230 (0.74%)		996 (0.48%)	
Native American	254690 (3.82%)		5090 (2.46%)	

- The descriptive analysis showed about 2.9% of patients had valvular disease comorbidity.
- About 58.27% of females had comorbidity of valvular disease and about 41.73% men.
- About 79.66% of patients with valvular disease comorbidity were of white race origin..

**Table 2: Multivariate Results**

Effect	Adjusted Odds Ratio Estimates and Confidence Intervals			
	Estimate	95% Confidence Limits		p-Value
Diabetes comorbidity present	1.597	1.242	2.053	0.0003
Hypertension comorbidity present	1.658	1.262	2.178	0.0003
Obesity comorbidity present	0.485	0.306	0.770	0.0022
Teaching vs non teaching	0.726	0.546	0.965	0.0273
Public insurance vs Private insurance	2.436	1.748	3.396	<.0001
Gender Male vs Female	0.617	0.483	0.788	0.0001
Household Income Below 50th Percentile vs Above 50th Percentile	0.757	0.596	0.961	0.022

Table showing the adjusted odds ratio, Confidence interval and P values of the multiple regression analysis between valvular disease and type of hospital, type of insurance and income status.

- Controlling for the effect of other variables, the association between the type of hospital, type of insurance, household income status, gender and the outcome of valvular disease was significant.
- This study showed patients at teaching hospital were less likely to have a valvular disease compared to non teaching hospitals, this is consistent with previous studies and can be explained by the faster adoption of novel evidence-based practices for the treatment of valvular disease in teaching hospitals compared to non-teaching hospitals.
- Our findings showed patients with public insurance were more likely to have comorbidity of valvular disease as compared to patients on private insurance. This finding is consistent with previous findings where patients with public (Medicare or Medicaid) insurance had worse outcomes of valvular disease than patients with private insurance.
- Hypertension and diabetes comorbidities were more likely to be associated with valvular disease. This is consistent with past findings about the trend of hospitalizations of patients with valvular disease of which about 54% had coexisting hypertension and 24% had coexisting diabetes.

## Implications

- Accreditation programs can ensure that non-teaching hospitals have the necessary resources, equipment, and personnel to manage patients at risk of valvular disease.
- Providing incentives, such as financial support or performance-based incentives, can encourage non-teaching hospitals to invest in the necessary resources and personnel to manage patients effectively.

## Limitations

- This study failed to control for the type of valvular disease. Also the study population were predominantly urban respondents.
- We noticed a few predictor variables perfectly predicted the outcome variable leading to a quasi-complete separation. These variables were removed to avoid problems with statistical inference and interpretation of results.

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## Methods

- **Study Design:** Cross-sectional using secondary data
- **Study population & Data:** 2012 National Inpatient Survey (NIS) data (N= 7296000).
- The Core, severity and Hospital data were used for this analysis.
- **Variable Measures**
- **Outcome or Dependent Variable:**valvular disease
- **Main independent variable:** type of hospital (teaching or non-teaching)
- **Control variables:** patient location, the age at diagnosis, insurance, income, and gender.
- **Analysis:** A descriptive statistic, bivariate and multivariate logistic regressions were conducted